

twenty-first anniversary of the publication of your great work, the "Origin of Species."

However limited the field of our own labours may be, we cannot but be sensible of the influence which that work has had throughout the whole domain of Natural Science, and especially upon Biology, which, as one great comprehensive Science, may be said to owe its very existence to the fact that you made belief in Evolution possible by your theory of Natural Selection.

We are glad to think that you have lived to see the almost universal acceptance of the great doctrine which it has been the work of your life to establish; it is hardly an exaggeration to say that every important Botanical or Zoological discovery of the last twenty-one years, particularly in the departments of Embryology and Palæontology, has tended to fill up some gap in the evidence you had originally collected, and to make Evolution no longer a theory, but an established doctrine of Science.

We hope that you may long live to continue your labours and to see the further spread of their influence upon all scientific thought and upon all higher scientific work.

We are, sir, your obedient servants,

THOS. MORGAN HOCKER	President
F. W. HUTTON	} Vice-Presidents
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GEORGE M. THOMSON	Hon. Sec.
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T. JEFFERY PARKER	
W. MACDONALD	
DONALD PETRIE	

Dunedin, New Zealand, October 1, 1880.

DEGREES TO WOMEN

WE trust the Grace which is to-day to be submitted to the Cambridge Senate, advocating the admission of women to receive University degrees, will meet with the approval of that body. In fact, as the *Times* put it yesterday, the point was ruled ten years ago. "Cambridge, in conniving at its public examiners examining Girton and Newnham students precisely as if they were Trinity or Johnian scholars, gave in spirit what is now demanded. It seems ungenerous, and not very rational, for a university to let its authorities proclaim a man in the Senate House eighth wrangler, and inform Girton College that the real eighth wrangler was a woman. Even a country clerical passman would not venture to withdraw the existing licence; all that remains is for the Senate to ratify with a good grace the principle upon which its officials have long and openly been acting."

The following paper, which has been issued from Cambridge in view of to-day's discussion, puts the case as fairly as it can be put:—

Reasons why the university should be one of the leading centres of female education.

1. Because no line can be drawn separating main subjects of study or whole branches of learning into those suitable for men and unsuitable for women, or *vice versa*. No true classification of human knowledge will admit of the distinction, "*Propria quæ maribus tribuntur, mascula dicas*." 2. Because the University as a chief inheritor and transmitter of learning from generation to generation has no right to dissociate itself from any great movement connected with the advancement of learning. The participation of women in the general and particularly in the higher studies of their time must be a great fact and factor in the future of education. 3. Because whatever educational resources may be found elsewhere, those of Cambridge and Oxford are peculiar; and though as long as there was no public demand for these resources except from male students they were properly applied only to male education, now that a demand has sprung up and persistently declared itself on the part of the other sex, the university will incur the reproach of inhospitable

partiality if it bars its doors, like a monastery, to female applicants for admission. 4. Because one of the legitimate wants and aspirations of the University—leisure for continued study and research—is likely to be promoted by increasing the amount of remunerative educational work done in the university. The more work, the more workers, and the more remuneration; and out of work, workers, and earnings, the legitimate and sure outcome will be leisure for the worthiest work and workers. 5. Because the education of women in England must, from irresistible national feelings and convictions, be religious and Christian; and if female education is centred in the university a stimulus will be given to the best religious influences in study and life; and from these the English universities have never for any long period been dissociated. 6. Because any mischievous consequences that might be feared, whether to the university or to the students, by the admission of women can be guarded against by suitable regulations, and still more by responsible authorities; whereas the diversion of the interests and influences that are gathering round the question of women's education from the university to other centres would be an irretrievable step, isolating the university for the future from a movement of great force and promise.

J. L. BRERETON

February 16

NOTES

AT the anniversary meeting of the Royal Astronomical Society, on the 11th inst., Mr. Hind, president, in the chair, the gold medal was presented to Prof. Axel Möller, Director of the Observatory at Lund, in Sweden, for his investigations on the motion of Faye's comet. Prof. Möller's researches commenced in 1860, soon after attention had been directed to this comet by the offer of a prize for the accurate determination of its orbit by the Society of Natural Sciences of Dantzic, and they have been continued to the present time, the comet's track at each of the three subsequent returns in 1865-66, 1873, and 1880-81, having been predicted with a precision which has excited in no small degree the admiration of astronomers; indeed, at the re-appearance in 1873, M. Stephan's first observation at the Observatory of Marseilles, showed that the error of predicted place was less than *six seconds of arc*, and after the last revolution, when the perturbations from the action of the planets were greater than in any previous revolution since the comet was first detected by M. Faye in 1843, the agreement between observation and calculation was still very close. One important result of these investigations has been a striking confirmation, from the motion of Faye's comet, of the value for the mass of Jupiter deduced by Bessel from the elongations of the satellites, the two values according within the limits of their probable errors. Prof. Möller also carried back the accurate computation of the perturbations to December, 1838, so as to ascertain the effect of a pretty near approach to Jupiter in March, 1841, upon the previous orbit, and having done this he examined the probable circumstances of a very near approach of the two bodies near the passage of the node in 1816, to which attention had been drawn by Valz soon after the comet's orbit was fairly determined. Thus Möller's laborious investigations extend over a period of forty-three years, during which he has followed the motion of the comet with all the refinements of which the actual state of the science admits. It will be generally accorded that the medal has been well earned in Prof. Möller's case. The last occasion on which it was awarded for investigations of a similar kind was as far back as 1837, when the Astronomer-Royal presented the medal to Rosenberger for his researches on the motion of Halley's comet.

At the anniversary of the Geological Society on Friday the medals were awarded as follows:—The Wollaston medal to Prof. P. Martin Duncan, M.B., F.R.S., F.G.S.; the Murchison medal to Prof. Archibald Geikie, F.R.S., F.G.S.; the Lyell medal to Principal Dawson, LL.D., F.R.S., F.G.S., of McGill College, Montreal; and the Bigsby medal to Dr. Charles Barrois of Lille. The Wollaston Fund was awarded to Dr. R. H.

Traquair, F.G.S., of Edinburgh; the Murchison fund to Frank Rutley, F.G.S.; the Lyell Fund in equal parts to G. R. Vines of Sheffield, and to Dr. Anton Fritsch of Prague.

IN addition to the amount reported last week, we have received two guineas from Mr. William Black for the John Duncan Fund, making the total received through NATURE £67 4s. 3d.

THE first of Prof. Flower's nine lectures on the Anatomy, Physiology, and Zoology of the Cetacea, in the theatre of the College of Surgeons, will be given on Monday next. The Comparative Anatomy of Man, which formed the subject of the last four courses of lectures, is far from being exhausted, especially as the acquisition of the Barnard Davis collection has more than doubled the materials at the disposal of the lecturer for its illustration. But the work of removing, cleaning, arranging, and cataloguing the numerous specimens of this collection has absorbed so much time, that little has been left as yet for their scientific examination. As any attempt at exposition of the variations of the osteological structure of man, from which the evidence afforded by the newly-acquired specimens is omitted, would be very incomplete, it has been thought advisable to postpone the continuation of the subject to a future time. The anatomy of the group selected for consideration this year is of great interest, and particularly well illustrated in the Museum, (as it is a subject to which John Hunter devoted much attention, and upon which he published a valuable memoir in the *Philosophical Transactions* for 1787, entitled "Observations on the Structure and Economy of Whales") :—General characters of the Cetacea; Division into two distinct groups—*Mystacoceti* or whalebone-whales, and *Odontoceti* or tooth whales; Anatomy of the lesser rorqual (*Balenoptera rostrata*) as a type of the *Mystacoceti*; Other whalebone-whales—rorquals (*Balenoptera*), humpbacks (*Megaptera*), and right whales (*Balana*); Anatomy of the porpoise (*Phocæna communis*) as a type of the *Odontoceti*; Other toothed whales—*Delphinida*, dolphins, beluga, narwhal, platystrophia, &c.; *Physeterida*—sperm-whale and its allies; Extinct Cetacea—position of the order in the animal kingdom, and relation to other groups.

WE regret that the Lords should have thrown out the Bill on Tuesday for the Opening of Museums and similar places on Sundays. The smallness of the majority leads us to hope that this forward and really beneficial step will be taken ere very long. As the *Times* very well puts it :—"The gravity of the question is that London has in its midst people to whom anything of the nature of intellectual toil—and prolonged sight-seeing is of that character—is essentially irksome. But they are human beings, and not lost to all salutary influences. It would be folly to despair of making the Sunday more tolerable than it is to them. Our climate does not often admit of men and women sitting out of doors talking or listening to elevating music. Some substitute must be found to put us on equality with the people of more sunny lands. It is the task of true friends of the working classes to suggest means by which, without any revolution in national ideas as to the sacredness of Sunday, they may be enabled to taste those simple and primitive pleasures—for example, the pleasure of pure repose of mind and body, or that of hearing music—which all, even the untutored, can enjoy. The movement is directed towards the cure of a real social evil, and those who oppose it are bound to suggest a more effectual remedy."

BY an oversight, for which the American authorities must be held partly responsible, we did not observe that the volume on "Odontornithes," by Prof. Marsh, briefly alluded to in NATURE of last week, was the same work which had already been reviewed in our columns as far back as September 16 of last year (vol. xxii. p. 457). The monograph now sent to us bears no reference

to the previous issue of the same work. It is announced as a portion of the Survey of the Fortieth Parallel under Mr. Clarence King; but no number is assigned to it as a volume of that splendid series of quartos. We hope that this new issue of the work will secure for it a still wider circle of readers, as it certainly adds additional lustre to the Survey of the Fortieth Parallel.

THE Hunterian Oration this year was so far original that the orator, Mr. Luther Holden, gave the results of some original research he has been making into the early life of John Hunter. It is usually said that Hunter, up to the time of his coming to London, led a completely idle life, giving no promise whatever of future eminence. Dr. Holden however thinks he has proved that Hunter, instead of being apprenticed to a cabinet-maker, entered Glasgow University when he was seventeen years old, and had the advantage of a regular training under the eye of Cullen. Whatever may be thought of the evidence Mr. Holden adduced, he has certainly opened fresh ground, quite deserving to be worked out by future orators.

THE freedom of the Cutlers' Company was conferred upon Sir Henry Bessemer last week. At the dinner which followed he stated that a young and rising American "city" had been named after him.

CAN any reader send us information concerning the fate of the instruments which belonged to the late Dr. Dick of Broughty Ferry, Scotland, the author of a number of theologico-scientific works ("Philosophy of a Future State," &c.), rather remarkable for their advanced views, considering the time at which they were published—about forty years ago? He is said to have left, among other things, a large telescope, the subsequent history and present possessor of which we are anxious to trace.

THE Commissariat-General of the Paris International Exhibition of Electricity are anxious that all requests for space be sent in as soon as possible, and not later than March 31.

THE following are prize-subjects lately proposed by the Society of Arts and Sciences at Utrecht :—Researches on the development of one or several invertebrate species of animals whose history is not yet known; exact anatomical description of the larva and nymph of the common cockchafer (*Melolontha vulgaris*); means of purifying the rivers of Holland so as to render them potable, and expense of application on a large scale; results of experiments in recent times as to the movement of liquids and the resistance they offer to moving bodies; study of the theories of electric phenomena in muscles and nerves; critical *aperçu* of the methods for determining the place occupied in bodies of the aromatic series by substituted atoms and groups of atoms (according to Kekulé and Ladenburg's theory regarding benzol); quantities of heat liberated or absorbed in the allotropic change of two or several simple substances; heat given by the moon in different phases. Papers may be written in French, Dutch, German, English, or Latin, and must be sent to the Secretary, Baron R. Melvil, of Lynden, before December 1, 1881. The prize is a diploma of honour and 300 Dutch florins.

A CLASSIFIED list of the books published in Germany during 1880, just issued by Hinrichs of Leipzig, shows the number of publications to be steadily increasing. We find a total of 14,941 new works against 14,179 in 1879. The largest number belongs to the class of school-books and other works for the young, viz., 2446 (against 2175 in 1879). We give the further classes in a descending scale, adding the numbers for 1879 :—Law, politics, statistics, conveyancing, 1557 (1683); theology, 1390 (1304); Belles Lettres, 1209 (1170); medicine, 790 (732); natural history, chemistry, pharmacy, 787 (841); historical works, 752

(680); popular works, almanacs, 657 (642); fine arts, stenography, 627 (584); commerce, 583 (577); classical and oriental languages, archaeology, mythology, 533 (481); modern languages, old German literature, 506 (485); agriculture, 433 (421); miscellaneous writings, 423 (378); architecture, railways, engineering, mines, and navigation, 403 (384); bibliography, encyclopædias, 377 (278); geography, travels, 356 (306); war, 353 (337); maps, 301 (300); mathematics, astronomy, 201 (158); philosophy, 125 (139); forests and game, 112 (103); freemasonry, 20 (21).

MESSRS. MACMILLAN AND CO. have in preparation, and will publish this year, "A Course of Instruction in Zootomy (Vertebrata)," by T. Jeffery Parker, B.Sc. Lond., Professor of Biology in the University of Otago. The work will consist of full directions for the dissection of the Lamprey, Skate, Cod, Lizard, Pigeon, and Rabbit, and will be illustrated by numerous woodcuts from the author's original drawings.

THE death is announced of Count Alexander Erdödy, a Member of the Pesth Academy of Sciences, vice-president of the Society for Plastic Art, and a liberal patron of science and art. His death occurred on January 24 at Vep (Hungary); he was eighty years of age. We regret also to announce the death of Herr Gabriel Koch, a Frankfort tradesman and an eminent lepidopterist, whose "Schmetterlingsbuch" has a wide reputation in Germany. He died at Frankfort-on-Main on January 22, aged eighty. On February 2 died Prof. Gorini at Lodi, well known by his works on volcanic phenomena. He was a teacher at the Lodi High School, and one of the warmest advocates of cremation in Italy.

EARTHQUAKES continue at Berne. A new shock, directed from east to west, was felt in the north of the town on February 8, at 5.25 p.m. Shocks of earthquake are reported from Braila on February 11 at 7h. 15m. a.m., and from Galatz at the same time.

It was not difficult to foresee that the warm weather which prevails now in the Alpine region, together with immense quantities of snow fallen during the previous days, would occasion several avalanches. On February 13 a terrible one descended from the slopes of Mont Pourri, and covered with a mass of snow, thirty feet deep, the village of Brévières, in the Tignes commune. Thirty-two persons were buried under the snow, and no less than three hundred peasants from the neighbourhood were engaged in sinking pits to reach the buried houses. Of the buried, twenty-five were found alive, four were dead, and three are not yet discovered. Two days later, another avalanche descended from the same mountain, and covered a space 10,000 metres wide, with a mass of snow fifteen to twenty metres deep. The pressure of air displaced by the avalanche was so great that all the windows of the village were broken within a few seconds. The quantity of snow fallen during the previous days was so great that all communication was broken up between Brévières village and the bottom of the valley; a peasant from Tignes took thirteen hours to reach the next town, Bourg-Saint-Maurice, travelling in the snow more than one metre deep.

THE provincial governments of Navarre and Logroño (Spain) have received the royal sanction to the necessary outlay for constructing and maintaining meteorological stations in these provinces.

OUR ASTRONOMICAL COLUMN

ENCKE'S COMET IN 1881.—So far as can be judged without the calculation of the perturbations since 1878 this comet will again arrive at perihelion about November 8 in the present year. In 1848, when the comet passed this point of its orbit on

November 26, it was detected with the 15-inch refractor at Cambridge, U.S., on August 27, as "a misty patch of light, faint and without concentration: its light coarsely granulated, so that were it not for its motion it might be mistaken for a group of stars of the 21st magnitude" (Bond). The theoretical intensity of light at this time was 0.21, and we find that, assuming the perihelion passage to occur on November 8, the comet should have this degree of brightness soon after the middle of August next, so that it may be anticipated observations will be practicable with the waning moon about the 20th of that month. The last perihelion passage took place on July 26, 1878, the period of revolution at that time being 1200.58 days according to the late Dr. von Asten. The aphelion distance is 4.879, the perihelion distance 0.3335, and the minor semi-axis 1.1675 (the earth's mean distance from the sun = 1). The approach to the orbit of the planet Mercury is still very close (0.031) in about 126°.5 heliocentric longitude. The nearest approximation of the two bodies that has occurred since the discovery of the comet's periodicity took place on November 22, 1848, when their distance was only 0.038. It is known that from his investigations on the motion of Encke's comet, von Asten inferred a much smaller value for the mass of Mercury than had been previously assigned, viz. $\frac{1}{7636440}$.

CINCINNATI MEASURES OF DOUBLE STARS.—Mr. Ormond Stone has issued an important series of measures of double stars made at the Observatory of Cincinnati, which is under his superintendence, between January 1, 1878, and September 1, 1879. The number of stars measured is 1054, of which 622 are south, and 432 north of the celestial equator: 560 belong to Struve's catalogue, 171 were discovered by the Herschels, 162 by Mr. Burnham, and 85 were found with the Cincinnati refractor, which has an aperture of eleven inches. The measures of the southern stars have a special interest, as there are comparatively few previous ones upon record. In his introduction Mr. Stone points out the most notable differences between the Cincinnati measures of angle and distance, and those of Struve, Sir John Herschel, and others; we shall refer to several of these cases in a future column. The volume is published by the Board of Directors of the University of Cincinnati, and will be a necessary addition to the libraries of those who are making the double stars their special study. Mr. Stone acknowledges his obligation to the Manual of Double Stars lately published by Messrs. Crossley, Gledhill, and Wilson, and M. Flammarion's "Catalogue des Étoiles Doubles et Multiples en Mouvement relatif certain."

THE MINOR PLANETS IN 1881.—The usual supplement to the *Berliner astronomisches Jahrbuch* (1883), containing its speciality, elements and ephemerides of the small planets for the present year, has been issued. We have in it approximate ephemerides for every twentieth day throughout the year of 210 planets, the latest being No. 217, and accurate opposition ephemerides of 58. Three planets are omitted for want of proper data for computation, viz. No. 99 *Dike*, No. 155 *Scylla*, and No. 206 *Hersilia*. A glance at this long series of ephemerides shows how wide a range over the heavens the apparent tracks of these small bodies present: thus we find *Euphrosyne* in opposition in 52½° south declination, in the constellation Indus, and *Niobe* in the vicinity of ζ Persei, with 43° north declination. A favourable opportunity for repeating observations for determination of the solar parallax would have been afforded if, in the first place, the actual position of No. 132 *Æthra* were pretty accurately known, and if Mr. Gill were able to utilise his heliometer at the Cape of Good Hope: this planet on February 28 being distant from the earth less than 0.84 of the earth's mean distance from the sun, with 47° south declination and rather greater brightness than a star of the ninth magnitude.

CHEMICAL NOTES

HAUTEFEUILLE AND CHAPPUIS state (*Comptes rendus*) that when a high tension spark is passed through a mixture of nitrogen and oxygen, ozone and "pernitric acid" are produced, but the latter compound is readily decomposed with production of a less oxygenated body and oxygen. When the electric discharge is passed through air in presence of water vapour very noticeable quantities of nitric acid are formed. The same observers have examined the absorption-spectrum of ozone and have recognised certain bands which they state are also found in the solar